DOCUMENT RESUME

ED 395 918 SP 036 737

AUTHOR Everhart, Brett; And Others
TITLE Preservice Teaching in Controlled and Natural Settings Prior to Student Teaching in Physical Education.
PUB DATE Apr 96
NOTE 18p.; Paper presented at the Annual Meeting of the American Educational Research Association (New York, NY, April 8-12, 1996).
PUB TYPE Reports - Research/Technical (143) -- Speeches/Conference Papers (150)

EDRS PRICE MF01/PC01 Plus Postage.
DESCRIPTORS Comparative Analysis; *Field Experience Programs; Higher Education; High Schools; *Microteaching; *Physical Education; Preservice Teacher Education; Student Teaching; *Teacher Behavior; *Time Management
IDENTIFIERS *Preservice Teachers

ABSTRACT

The purpose of this study was to compare the teaching of preservice teachers in both a controlled and a natural setting prior to student teaching. Data were collected on single lessons of each subject (n=14) who taught in a peer teaching microlesson and a lesson within units taught at a local high school. Subject matter was controlled so that each subject taught similar units in both settings and the time within the unit was similar (i.e., 2nd lesson within the unit). Dependent variables were three teaching behaviors and two student outcomes: rates per minute of corrective feedback, percent management time, rates per minute of instructional sequences, percent motor appropriate (ALT-PE), and percent waiting time. Data were collected via a computerized systematic observation instrument designed to collect real-time information (frequency, duration, rates per minute, etc.) on teaching and learning in physical education. Interobserver agreement was established by training the observer in an 8-week program in which reliability of at least 80 percent was required for three successive viewings of videotaped lessons. A dependent t-test was calculated to determine the differences between the mean differences of variables between settings. Percent management time was the only variable found significantly different. In addition, subjects wrote summaries of perceived comparisons of teaching in the two settings, and methods of content comparison were used to analyze the qualitative data. Results indicated the controlled setting prepared the preservice teachers for the natural setting, but that the natural setting produced more unexpected variables within the context affecting management time. (Contains 28 references.) (Author/ND)

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ED 395 918

Preservice Teaching in Controlled and Natural Settings Prior to Student Teaching in Physical Education

Brett Everhart, Robert Johnson, and Ben Brantley

Appalachian State University

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Paper presented at the 1996 National Convention of the American Educational Research Association in New York, NY.

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Abstract

The purpose of this study was to compare the teaching of preservice teachers in a controlled and natural setting prior to student teaching. Data were collected on single lessons of each subject (n=14) who taught in a peer teaching microlesson and a lesson within units taught at a local high school. Subject matter was controlled so that each subject taught similar units in both settings and the time within the unit was similar (i.e, 2nd lesson within the unit). Dependent variables were three teaching behaviors and two student outcomes: rates per minute of corrective feedback, percent management time, rates per minute of instructional sequences, percent motor appropriate (ALT-PE), and percent waiting time. Data were collected via a computerized systematic observation instrument designed to collect real-time information (frequency, duration, rates per minute, etc...) on teaching and learning in physical education (Hawkins & Wiegand, 1989; Sharpe, 1994). Interobserver agreement was established by training the observer in an eight-week program in which reliability of at least 80% was required for three successive viewings of videotaped lessons. A dependent t-test was calculated to determine the differences between the mean differences of variables between settings. Percent management time was the only variable found significantly different (p=.0344) at .05. In addition, subjects wrote summaries of perceived comparisons of teaching in the two settings and methods of contant comparison (Patton, 1990) were used to analyze the qualitative data. Results indicated the controlled setting prepared the preservice teachers for the natural setting, but that the natural setting produced more unexpected variables within the context affecting management time.

Physical education teacher education (PETE) programs provide field experiences for majors prior to student teaching, but very little of that time is devoted to the actual teaching process (Placek & Silverman, 1983). The importance of quality field experiences for preparing teachers has been established (Dodds, 1985; Iannaccone, 1973), but the negative effects of poor field experiences (Adkins, 1980; Levine, 1980; Templin, 1979) may cause teacher educators to avoid the arranging of pre-student teaching experiences. Because of the potential negative influences caused by the schools and the poor guidance from weak cooperating teachers during field experiences and student teaching (Denscombe, 1982; Edwards, 1982; Lacey, 1977; Templin, 1979), it is necessary to provide more quality teaching experiences for preservice teachers prior to student teaching.

Although it is accepted that there is no real substitute for the realistic practice of preservice teaching in the natural setting, the more controlled setting of teaching university peers prior to the natural setting can also be helpful in the preparation of teachers. Shulman (1987) discussed the relevant knowledge structures of teaching, emphasizing the influence of the specific nature of pedagogical content knowledge on teaching performance. He drew comparisons to an English major with no collegiate grammar background teaching grammar in the public schools during a field experience. The student teacher struggled while teaching grammar and commented that she attempted to avoid eye contact with students to disguise her uncomfortability with the subject matter. Sockett (1987), in response to Shulman's (1987) classic work on teaching knowledge argued that the context of teaching makes a difference in the development of pedagogical content knowledge. He noted that the elements of teaching are context specific, much like the difference between playing golf in the driving wind and rain of

St. Andrews or playing in the warm, spring air of Augusta.

> Context personality, temperament and style are not merely adjuncts to the knowledge base; they are the very stuff of practice..... For the teacher, the unique variable and unpredictable elements are the human beings who are learning, individually and in groups in hugely varying contexts and social climates. (Sockett, 1987, p. 209)

Therefore, if teacher educators are to provide preservice teachers with appropriate teaching experiences prior to student teaching, they must enable preservice teachers to develop appropriate pedagogical content knowledge specific for public school instructional setting. In order for preservice teachers to apply learned knowledge of teaching, clinical experiences must be provided. It is helpful, though, to provide controlled experiences as well as natural experiences. The work of Lanier and Little (1986) supports the concept of a controlled laboratory experience prior to entering the public school setting. This experience would afford the preservice teacher with the opportunity to practice applying these teaching skills prior to public school instructional experiences. The value of the teaching experience in the public schools is dependent upon the preservice teachers being properly prepared to teach prior to that experience (Lanier & Little, 1986). Therefore, a controlled setting allows preservice teachers to practice teach and receive feedback before teaching in a public-school setting. Research in education has found that student teachers teach more effectively if they have had controlled teaching experiences previously (Borg, et al, 1969; Manis, 1973; Ng, 1977; Vare, 1992; Walters, 1974). However, research is limited on the effectiveness of prestudent teachers teaching in the public schools following the controlled teaching experiences.

The use of controlled settings has been advocated by preparation programs in physical

education. Landin, Hawkins, and Wiegand (1986) used a controlled setting for preservice physical education teachers to provide them an opportunity to apply pedagogical content knowledge while teaching intact classes of peers. After teaching, each teacher received feedback from a teacher educator. Results showed an improvement in teaching and learning variables in subsequent lessons, demonstrating a positive effect of using feedback with peer teaching to prepare physical educators (Grant, Ballard, & Glynn, 1990). Paese (1986) compared the teaching of inexperienced preservice teachers with student teachers. He found that the inexperienced group generated higher management time and less instruction. His findings are in line with current research which has decribed the tendency for inexperienced physical education teachers to focus more on management than experienced teachers (Griffey & Housner, 1991; Sharpe & Hawkins, 1992). Because of the greater number of complexities, it is logical to assume that preservice teachers teaching in the public schools would be more management oriented than when teaching in a controlled setting. The purpose of this study was to compare the teaching behaviors and student outcomes of preservice teachers' lessons when utilizing a controlled and natural setting for for an early clinical teaching experience prior to student teaching.

Methods

Participants and Procedures

Fourteen preservice teachers enrolled in their last semester before student teaching planned their own units of randomly selected subject matter and taught three successive lessons on separate days in both a controlled (peer teaching) and natural (high school) setting. During the controlled setting experience, the preservice teachers taught intact classes of 10-16 peers

enrolled in the teaching methodology courses. Following the teaching of each lesson, feedback was provided to the preservice teacher by the clinical supervisor. Feedback from the clinical supervisor included strategies derived from observational field notes and computer-generated feedback. The preservice teachers then would plan and teach according to feedback provided. Following completion of the controlled experience, the same subjects taught a similar unit in a local high school (natural setting). That is, if a preservice teacher taught a racket sport unit, that subject would teach a racket sport in the other setting. In the natural setting, the preservice teachers taught an average of 24 students in eight different classes.

Data Collection

The clinical supervisor used a laptop to record the teaching and student behaviors within each coded lesson (Hawins & Wiegand, 1989). Data were generated in terms of frequencies, durations, and rates of occurrence. For the peer teaching lessons, only data recorded in the final lesson were used. Data were recorded for 20 minutes of the public school lessons, starting and ending at the same points in both settings. The use of 20 minutes is supported by previous use of lessons of short durations in the physical education literature (Graham, 1983; Landin, Hawkins, & Wiegand, 1986; Paese, 1986; Pieron & Graham, 1984). Data were recorded in lessons other than the first in each unit so that the preservice teachers could "get their feet wet" in the setting.

Instrumentation

The evaluation instrument used was the West Virginia University Teacher Evaluation System (WVUTES; Hawkins & Wiegand, 1989) modified by Sharpe (1994). This system allows one to analyze up to 11 teacher behaviors and eight student behaviors related to teaching

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effectiveness and student outcomes. This system has the capability to provide real-time information for each category for duration, frequency and their derivatives: mean, minimum, and maximum lengths of occurrences; percentage of total time; and rate per unit of time (Hawkins & Wiegand, 1989). Interobserver agreement (IOA)was established at 80% by matching videotape observation session analyses with the analyses of an expert in the system. The IOA training involved memorizing variable definitions as well as practice recording for temporal agreement.

Statistical Analysis

Following completion of the data collection, the researcher analyzed a group of 5 teaching and student behavioral variables. The teaching variables analyzed were rate per minute of corrective feedback, percent management, and rate per minute of instructional sequences. Student variables were percent motor appropriate[1] and percent waiting. Variables involving rates were calculated by dividing the the frequency of occurrence of the appropriate variable by the total number of lesson minutes. The instructional sequences are united patterns of instructional feedback and specific observation in a single sequence. An example would be when a teacher specifically observes a practicing student, provides appropriate feedback when necessary and then remains to see how the student responds to the feedback. The use of rates of instructional sequences as a variable is supported by Sharpe and Hawkins (1992b), who provided a behavioral description of an expert physical educator who continuously provided instructional feedback in a rhythmical pattern during student engagement.

Differences between scores in each setting were were calculated by subtracting the

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[1]motor appropriate - the amount of time that a student is engaged successfully in a subject matter motor task (ALT-PE).

teaching score means in the natural setting from the controlled setting. Because the two settings (controlled and natural) consisted of the same subjects, it was necessary to analyze the data by repeated measures analyses within multivariate analyses of variance (MANOVA). Wilks Lambda analyzed the levels of statistically significant differences between settings with the variables. Finally, a dependent t-test was calculated to determine the differences between the mean differences of variables between settings. In order to provide indepth descriptions as to personal preferences for settings, 10 subjects wrote unlimited paragraphs as to the advantages and disadvantages of teaching in both settings. However the directions given were general so as not to lead subjects to write according to researchers' expectations. These summaries were analyzed by means of constant comparison (Patton, 1990).

Place Figure 1 about here

Results

Multivariate analyses of variance (MANOVA) with repeated measures

Gain scores of the settings were determined by subtracting the means of the natural setting scores from the controlled setting scores. A multivariate analyses of variance (MANOVA) with repeated measures analysis of the gain scores revealed the equality of the setting dispersions, demonstrating homogeneity of the settings and variables. Wilks Lambda analyzed the statistical significance of the differences between scores from both settings. Scores were significantly better in the controlled setting at the .05 level of alpha. Wilks = .002, F (10, 10) = 37.24 (p=.001)).

Dependent t-test

A dependent t-test was used to determine whether significant differences exist between

the controlled setting and natural setting scores. A statistically significant difference between settings gain scores was found at the .05 level for only the percent of management time (PMAN) $t(13, 13) = -2.33$, $p<.0344$. The difference between gain scores of rates per minute of corrective feedback were not significant between settings (RC), $t(13,13) = .714$, $p<.4859$. The difference in the gain scores of the percent of motor appropriate time (MA) were not significant between settings, $t(13,13) = -.897$, $p<.3841$. Likewise, significant differences were not found in the gain scores of the percent of waiting time between settings (WAIT), $t(13,13) = -.7588$, $p<.4597$ nor the rates per minute of instructional sequences (SEQ), $t(13, 13) = 1.967$, $p<.0694$. See table 1.

Place Table 1 about here

Subjects' reflections

Subjects' responses as to the advantages and disadvantages of teaching in a controlled setting before teaching in a natural setting indicated that teaching in the controlled setting first enabled them to be more comfortable teaching in the natural setting. They described their preferences for teaching in the public school, but that without the peer teaching experiences, their public school teaching would have been harder. Below are a few examples of the preservice teachers' comments which were indicative of the overall consensus of responses.

> The peer teaching situation was also very helpful to the student teacher in that it made the student better understand the preparation involved in teaching a class. The paper work and set up for this situation made me better prepared for what would happen in the public school. It also gave the student teacher the opportunity to be critiqued by his or her peers and the teacher, which let the student teacher know what to work on improving within the

lesson and in the preparation for the lesson. Peer teaching is a building block to the experience with the public school situation. The public school experience would be an absolute failure without first experiencing the peer teaching situation. (preservice teacher #1)

The peer teaching provided me with the confidence in myself to do a better job in the public schools. Unit preparation, daily lesson plans, and most of all the evaluation of my teaching style and feedback patterns really focused me on where I was weak and needed improvement. Once the shortcomings were identified, it was easier to develop strategies to improve in my teaching. The public school experience provided me with the knowledge of the problems that will face me in the future. Crowded classes, poor facilities, and hard-to-reach students are examples of these problems. (preservice teacher #2)

The public school was the best experience because it was the real thing. As the teacher I had complete control over the students. If I had not accomplished control, I would have found a way to do that. I don't think you can do anything to improve the public school setting. The peer teaching is also hard to improve, although the concept of peer discipline could be improved on. I know that we should discipline our peeers the same way as the (public) students, but they are two different sets of people. In other words, the peer teaching is good if that is all we can get access to (for preparation). (preservice teacher #3)

Discussion

Results indicate that there were differences in the way preservice teachers taught in a controlled setting (peer teaching) as opposed to a natural setting (public school). Management time in preservice teachers' lessons in the natural setting was significantly higher than in the controlled setting. This supports the literature which describes novice teachers as managerially oriented (Griffey & Housner, 1991; Sharpe & Hawkins, 1992; Siedentop, 1991). Various factors within the setting may have affected management time negatively. Some examples of such factors include the different numbers of students attending in each class, equipment repairs needed, a crowded gymnasium due to rain, etc... With more experience with these unexpected elements, perhaps the preservice teachers would continue to improve. However, management time is what physical educators spend more time doing typically (Siedentop, 1991); therefore, preservice teachers should not be expected to manage efficiently for higher amounts of motor appropriate time in just one week of teaching. Teaching is context specific (Shulman, 1987; Sockett, 1987) and the preservice teachers may have needed more time to adjust to the setting.

Even with more time in the natural setting, the controlled setting (peer teaching or microteaching) allows students to correct weaknesses before public school teaching (Manis, 1973; Ng, 1977; Vare, 1992; Walters, 1974) and that may have allowed for more of a smooth transition. This may be why the results demonstrate that subjects used the other teaching strategies almost equally as well in the natural setting.

Teaching effectiveness in the natural setting may eventually improve once preservice teachers become comfortable with the surroundings and the students. This would imply that preservice teachers should be expected to teach in thepeer teaching setting to identify their

curricular zone of safety (Rovegno, 1992) and eventually find that zone of safety to be more effective with more practice in the natural setting. With repetitive practice in the public school setting, the preservice teachers could eventually demonstrate teaching which is more characteristic of expert teachers (Siedentop & Eldar, 1989). This is descriptive of what the literature has recently suggested -- that the gap between novice teachers and expert teachers may narrow with more appropriate pedagogical clinical experiences before student teaching (Graham, et al., 1993; Sebren, 1995).

Results of this study demonstrate a need to provide preservice teachers with appropriate practice opportunities prior to teaching in the public school settings. Results also show that even with appropriate teaching practice in a controlled setting, it may take more time teaching in the natural setting for preservice teachers to manage effectively because of the context specific nature of teaching.

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Figure 1. Definitions of behaviors used as dependent variables.

Corrective Feedback (RCFB) - the teacher makes a negative or critical verbal statement or gesture following an inappropriate student behavior (skill or organizational) which is designed to decrease or eliminate such responses in the future.

Management PMAN) - the time in which the teacher is engaged in carrying out a non-subject matter, organizational task.

Motor Appropriate (PMA) - the time a student is engaged in a subject-matter motor activity in such a way as to produce a high degree of success.

Waiting (PWAIT) - the time in which the student has completed a task and is awaiting the next instructions or opportunity to respond.

Rates of Instructional Sequences (RTSEQ) - the rates per minute that teachers engage in a pattern of instructional feedback, followed by specific observation of a practicing student, followed by more instructional feedback. Observation may begin the episode as well.

Table 1

Means, Differences in Scores, Probabilities, and Statistical Significance Found With Dependent t-tests Between Controlled and Natural Settings

	Controlled	Natural	Combined	
Source[1]	Mean1	Mean2	Differences	p
RCFB	.5± .11	.3± .08	-.2	.4859
PMAN	8.1± 1.6	18.9± 2.1	10.8	.0344 *
PMA	13 ± .96	6.4± .94	-6.6	.3841
PWAIT	3.1± .56	6.2± 1.1	3.1	.4597
RTSEQ	.7± .13	.1± .05	-.6	.0694

[1]RC= rate per minute of corrective feedback; PMAN= percent of management time; PMA= percent of motor appropriate time; PWAIT= percent of waiting time; RTSEQ= rate per minute of instruction/observation sequences.

* significant at .05 level.